

BENNETT'S MILL BRIDGE
National Covered Bridges Recording Project
Spanning Tygart's Creek, East Tygart's Creek Road (CR 1215)
Lynn vicinity
Greenup County
Kentucky

HAER No. KY-49

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service
U.S. Department of the Interior
1849 C St. NW
Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD

BENNETT'S MILL BRIDGE

HAER No. KY-49

LOCATION: Spanning Tygart's Creek at East Tygart's Creek Road (CR 1215), Lynn vicinity, Greenup County, Kentucky
UTM: 17.332265.4277574, Portsmouth, Ohio Quadrangle

STRUCTURAL TYPE: Wood covered bridge, modified Wheeler truss

DATE OF CONSTRUCTION: 1874 or 1875; rebuilt 2003

**DESIGNER/
BUILDER:** Unknown, but possibly Isaac or William Wheeler¹

PRESENT OWNER: Greenup County, Kentucky

PREVIOUS USE: Vehicular bridge

PRESENT USE: Vehicular bridge

SIGNIFICANCE: The Bennett's Mill Bridge is the sole surviving Wheeler truss covered bridge in the United States. Patented in 1870 by Isaac H. Wheeler of Scioto County, Ohio, this unusual truss design never made it into the mainstream of bridge building, but it did experience a brief period of popularity in the area around Sciotoville, Ohio, in the early 1870s. The bridge represents a post-Civil War resurgence of covered bridge building that saw innovations in truss design aimed at making wooden bridges increasingly efficient and economical.

HISTORIAN: Researched and written by Lola Bennett, November 2003

PROJECT INFORMATION: The National Covered Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is administered by the Historic American Buildings Survey/Historic American Engineering Record, a division of the National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project.

¹ Isaac Wheeler (1815-1875) was an agent for the Smith Bridge Company of Toledo, Ohio in the early 1870s, and according to Nelson Evans' *A History of Scioto County, Ohio* (1903), Isaac Wheeler's son William (1841-1896) was a contractor who built roads and bridges in and around Scioto County.

Chronology

- 1830 E.A. McGee and Joseph and Gabriel Darlington build an iron furnace at this site
- 1832 Tygart Furnace (later, Globe Iron Furnace) begins operations
- 1841 Globe Furnace operations suspended
- 1855 Benjamin F. Bennett and William P. Bennett establish a saw and grist mill at this site
- 1855 First bridge constructed near Bennett's Mill
- 1870 Isaac Wheeler of Sciotoville, Ohio, receives a patent for a wooden bridge truss
- 1874 Wheeler truss covered bridge constructed at Bennett's Mill
- 1875 Isaac Wheeler dies
- 1915 Bennett's Mill Bridge repaired; roof and siding replaced
- 1954 Bennett's Mill Bridge repaired
- 1964 Kentucky Covered Bridge Association founded; nineteen surviving covered bridges in Kentucky
- 1975 Bennett's Mill Bridge listed on the National Register of Historic Places
- 1976 Bennett's Mill Bridge repaired following damage from an overloaded vehicle
- 1994 Greenup County Covered Bridge Authority formed
- 2000 Federal Highway Association awards \$600,000 for rehabilitation of Bennett's Mill Bridge
- 2001 Bennett's Mill Bridge closed to traffic and disassembled
- 2003 Bennett's Mill Bridge rebuilt

Description²

The Bennett's Mill Bridge is a single-span Wheeler truss covered bridge on cut, dressed sandstone abutments. The bridge is 171'-6" long overall, with a 153'-6" clear span. The trusses are 16'-0" high from the top of the upper chord to the bottom of the lower chord and the bridge is 20'-0" wide overall, with a roadway width of 16'-0". Each truss has sixteen 9'-0" panels and two end panels.

The yellow pine trusses are framed in the general manner patented by Isaac Wheeler in 1870, modified with double tension members and compression members that are not offset. The lower chords are composed of a line of 7"x11" timbers, flanked by a pair of 6"x11" (originally 6"x8") timbers. The timbers are spaced 3" apart, blocked and bolted, and spliced with combination keys. The upper chords are arranged in a similar manner. The secondary chord, a distinctive feature of the Wheeler truss, is composed of a 7"x9" timber flanked by 6"x9" timbers. The chords sandwich the double truss web, composed of paired vertical 7"x8" posts at the center and ends of each truss, paired diagonal 7"x8" tension members angling up towards the ends of the bridge, and short 7"x8" compression members placed diagonally between the tension members. A bolt holds the tension members where they pass through the upper and lower chords. The compression members are notched into the posts and diagonals.

The lower chords are seated on three 2"x12" bedding timbers on a new poured concrete seat on top of the original cut, dressed sandstone abutments.³ The 3"x10" transverse deck beams are seated on the lower chords about 1'-8" apart. There are no stringers. The deck is rough-sawn 2"x10" boards nailed diagonally to the upper edge of the deck beams. Lower lateral bracing is 4"x5" timbers, crossing within each panel between the lower chords.

Overhead bracing consists of a pair of 4"x6" tie beams at each panel point, with 4"x6" cross braces between the tie beams. The original tie beams were spaced about 10' apart, although some tie beams had been replaced with irregularly sized members. The tie beams in the first three panels were 6"x6" or 6"x8" and the others were 5"x5". The three larger tie beams had sway braces mortised into them and into the counterbraces. At each panel point, 1" iron rods tied the upper chords together.

The rebuilt superstructure of Bennett's Mill Bridge was completed in the fall of 2003. As of November 2, 2003, the bridge did not have a roof or siding. Louis Bower replaced the original roof and siding in 1915. At that time, galvanized sheet metal covered the roof, and vertical planks sided the bridge. The portals were painted green and white, a Bower Bridge Company trademark. At a later date, vertical tongue-in-groove siding replaced much of the siding, and the bridge was painted white.

² The Bennett's Mill Bridge was rebuilt in 2003. The description is based on photographs, inspection reports and measured drawings from the Kentucky Heritage Council and measurements taken of the reconstructed span on November 2, 2003. The deck system has been completely rebuilt, and concrete caps have been added to the old abutments. About 50 percent of the truss members appear to be new.

³ The cut stone for the abutments came from the Globe Iron Furnace (c.1831) that once stood near this site.

Kentucky Covered Bridges

Covered bridges were built in all parts of Kentucky, but they were largely concentrated in the central and northeastern part of the state where the earliest settlement took place.⁴ By the mid-nineteenth century, there were an estimated 200 covered bridges in Kentucky, and by the late nineteenth century, 400. That number began to decline in the early twentieth century, as modern spans replaced covered bridges.

When the state's last authentic covered bridge was built in 1924, Kentucky still had an estimated 200 covered bridges.⁵ When the Kentucky Highway Department mapped county roads in 1937, they inventoried 125. By 1964, when the Kentucky Covered Bridge Association was founded to protect the surviving covered bridges, only about twenty remained. Today, there are thirteen. The surviving bridges have reported construction dates ranging from 1835 to 1880 and represent a range of truss types, including multiple kingpost, queenpost, Burr, Town, Howe, Smith and Wheeler.

In 1972, the Kentucky Legislature authorized the Kentucky Heritage Council to designate covered bridges as state shrines. By 1976, all of the state's surviving covered bridges were listed on the National Register of Historic Places. Since 1980, the Kentucky Transportation Cabinet and the Kentucky Department of Parks have been jointly responsible for covered bridge maintenance and preservation. All of Kentucky's covered bridges have been rehabilitated or rebuilt within the last fifteen years.

History of Bridge and Site

Greenup County's waterpower and iron ore deposits supported early nineteenth century industrial settlement of the region, and by the mid-nineteenth century, there were at least ten blast furnaces in operation.⁶ In 1830, E.A. McGee, Joseph Darlington and Gabriel Darlington established the Tygart Creek Manufacturing Company (later, Globe Iron Furnace) and built a blast furnace near this site. The company reportedly did well for a decade, producing as much as 600 tons of pig iron annually, but financial difficulties led to changes in the partnership and the abandonment of the furnace in 1841.⁷

The site lay idle until 1855, when Benjamin Franklin Bennett (1829-1914) of Scioto County, Ohio, purchased the property and built Greenup County's first grist mill.⁸ A bridge was

⁴ L.K. Patton and R.W. MacGregor Laughlin, *Kentucky's Timbered Tunnels* (Fort Thomas, Kentucky: Kentucky Covered Bridge Association, 1994), p.21.

⁵ Patton and Laughlin, p.1.

⁶ Lewis Collins, *Historical Sketches of Kentucky* (Maysville, Kentucky: Lewis Collins, 1847), p.331. According to J. Winston Coleman Jr., there are records of at least sixteen nineteenth century iron furnaces in Greenup County.

⁷ David Spencer, "Another Time and Place: Bennett's Mill," *The Greenup News* (Greenup, Kentucky), c.1984, p.7.

⁸ Nelson W. Evans, *A History of Scioto County, Ohio*, Volume II (Portsmouth, Ohio: Nelson W. Evans, 1903), p.902.

reportedly built here in 1855. The crossing appears on Mylotte and Beirne's 1856 "Geological Survey Map of Greenup County," but no documentation has been found concerning that structure.⁹ Historic maps show alterations to this crossing occurred sometime between 1856 and 1876, presumably when the present bridge was constructed.¹⁰ According to Greenup County Court Records, in 1872, the county attempted to repair an existing bridge at Bennett's Mill, but ultimately decided to replace it with a new bridge. In November 1872, the Greenup County Commissioners appropriated \$10,000 for building and repairing bridges, including "a Bridge across Little Sandy at the Argillite Mills, and one across Tygarts Creek at Bennetts Mills."¹¹ The commissioners appointed contractor A.L. Reid and mill owner B.F. Bennett to superintend construction of the bridge at Bennett's Mill. No written documentation has been found concerning construction of the Bennett's Mill Bridge, but it was presumably completed in 1874 or 1875. In November 1875, the county paid B.F. Bennett \$100 "for superintending the building of the bridge at Bennetts Mills."¹²

With regular maintenance and repairs in 1915, 1954 and 1976, the Bennett's Mill Bridge carried traffic for 125 years. By the late 1990s the bridge was classified as unsafe, but it remained open for travel until 2001. In 2000, the Federal Highway Administration's National Covered Bridge Preservation Program awarded the state of Kentucky \$600,000 for rehabilitation of the ailing structure. In 2002, the state awarded a contract to Intech Contracting of Lancaster, Kentucky, a firm that has worked on many of the state's covered bridge projects. Since the lower chords and deck were scheduled to be replaced, and extensive sections of the trusses were proposed for repairs or replacement, the contractor opted to rehabilitate the structure off-site.¹³ In the summer of 2002, the bridge was taken apart and trucked to Intech Contracting's fabrication shop at Lancaster, Kentucky.¹⁴ The trusses were partially reassembled in the fabrication shop and deteriorated members were replicated using old members as templates. In the summer of 2003, the contractor trucked the bridge back to Tygart's Creek for on-site reconstruction.¹⁵ The superstructure appeared to be near completion during a site visit in November 2003.

Isaac Wheeler and the Wheeler Truss

Isaac Hastings Wheeler was born in Ohio in 1815 and died in Missouri in 1875. For a time, he owned and operated several mills in Scioto County, including the Wallace Mill in Madison Township and the Harrison Mill in Harrison Township.¹⁶ He served as Sheriff of Scioto County in 1844-45 and as Scioto County Commissioner in 1866. In the early 1870s, Wheeler became an

⁹ The 1855 date is often erroneously given as the date of construction for the present bridge.

¹⁰ Compare Mylotte and Beirne's 1856 geological survey map of Greenup, Carter and Lawrence counties with Schenk and Mitchell's 1876 geological survey map of Greenup, Carter, Boyd and Lawrence counties.

¹¹ *Greenup County Court Records*, November 6, 1872, p.381.

¹² *Greenup County Court Records*, November 2, 1875, p.204.

¹³ Phil Helfenberger (Intech Contracting), Conversation with Lola Bennett, February 18, 2003. According to the Kentucky Heritage Council, five of the six covered bridges rehabilitation projects contracted to Intech have been off-site projects.

¹⁴ Interview with Robert W. Carpenter, Greenup County Judge, February 29, 2003.

¹⁵ www.fhwa.dot.gov/bridge/cbfy00pd.htm

¹⁶ Evans, Volume I, p.374.

agent for the Smith Bridge Company of Toledo.¹⁷ This may have inspired his interest in bridges, and more particularly, the design of the bridge truss he patented in 1870.¹⁸

The Wheeler truss bears some similarities to the Smith truss and is characterized by single tension members, double offset compression members, and an intermediate chord along the midline of the truss.¹⁹ Wheeler reportedly received royalties of \$1.00 per foot for the use of his patent, and the type experienced a brief period of popularity in the area around Sciotoville, Ohio prior to Wheeler's death in 1875.²⁰ As one of many new bridge truss types developed after the Civil War, the Wheeler truss went largely unrecognized and did not carry forward into the mainstream of bridge building. The type was so unusual, in fact, that Bennett's Mill Bridge was not identified as a Wheeler truss until covered bridge historian Joseph Conwill recognized it as such in 1993.²¹

¹⁷ Miriam Wood, *The Covered Bridges of Ohio* (Columbus: Old Trail Printing Company, 1993), p.39.

¹⁸ Isaac H. Wheeler, "U.S. Letters Patent No. 107,576," September 20, 1870.

¹⁹ Wheeler, "U.S. Letters Patent No. 107,576."

²⁰ There are records of at least nine Wheeler truss covered bridges being built between 1870 and 1875: six in Scioto and Lawrence counties in Ohio and three in Greenup County, Kentucky.

²¹ Joseph D. Conwill, "Wheeler Truss Discovered in Kentucky," *Covered Bridge Topics*, Spring 1993.

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